Emergency Telecommunications Service (ETS)

Outputs

- Technical contributions to ANSI Working Group T1A1.2.

- Technical contributions to ITU-T Study Group 9.

- Letter report to NCS on NS/EP Communications over Metropolitan Area Networks (MANs).

In the aftermath of the recent terrorist attacks, the Federal Government has refocused its interests on priority treatment of emergency communications. While the Government Emergency Telecommunications Service (GETS) has served emergency workers well for many years, it is limited to the Public Switched Telephone Network (PSTN) within the United States. ETS is envisioned as a GETS-like service that will be available internationally and will encompass virtually all wireless and wireline communications networks. Types of traffic to be carried include voice, video, database access, text messaging, email, file transfer protocol (FTP), and web-based services.

The ETS effort at ITS encompasses several projects including Packet-Switched Networks and Network Survivability. For these projects, computer simulation, laboratory studies, security analyses, and traffic engineering are used to support Critical Infrastructure Protection (CIP) initiatives. These two projects are funded by the National Communications System (NCS). This work supports NCS in its mission to protect the national security telecommunications infrastructure, and to ensure the responsiveness and survivability of essential telecommunications during a crisis.

For the first project, Packet-Switched Networks, the Institute develops and verifies ETS Recommendations for International Telecommunication Union — Telecommunication Standardization Sector (ITU-T) Study Group 9 (integrated broadband cable and television networks). The major goal of this project is to ensure that future ETS mechanisms will interoperate over broadband cable television networks. Additionally, the project is working to facilitate the evolution of GETS over the IPCablecom network.
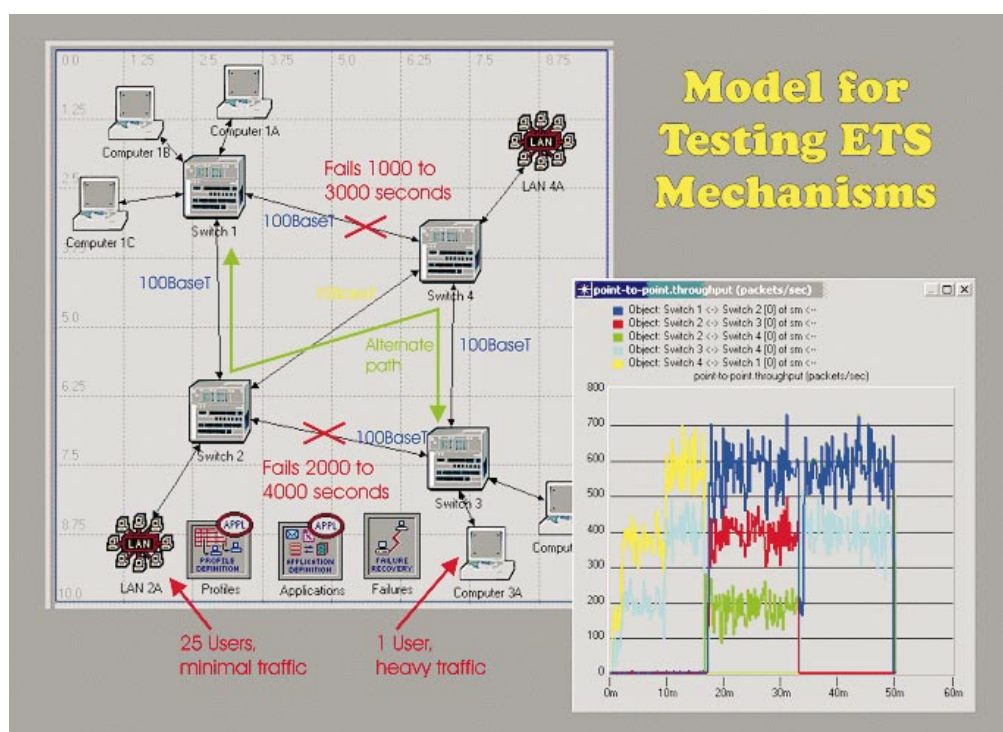

Figure 1. Simulation for testing ETS protocols.

The second project, Network Survivability and Restoral, provides ETS expertise relating to Network Survivability for ANSI-accredited Technical Subcommittee T1A1 (performance, reliability, and signal processing). Within this project, ITS serves as co-editor of a new T1 Technical Report: "Overview of Standards in Support of Emergency Telecommunications Service (ETS)."

Figure 2. Laboratory setup for testing security and ETS protocols.

Traditional analysis methods are not adequate to predict the effects of large service outages in the current and future network environments. Therefore, ITS is using network modeling and simulation tools to address the needs of Working Group T1A1.2 (network survivability performance), national security and emergency preparedness (NS/EP), and the nation. While modeling and simulation are powerful tools for the assessment of threats and mitigation techniques, the simulations need to be well grounded in the physical measurement of important parameters. One of the goals of the project has been to produce baseline models for reference network architectures that can be used both in standards development and in future network research by ITS and others. Figure 1 shows one such reference model developed to test proposed ETS mechanisms.

The standardization work in ITU-T Study Group 9 is focused on the IPCablecom family of Recommendations. These Recommendations define the protocols and signaling to be used on broadband cable television networks to support telephony, multimedia, and Internet access. The IPCablecom Recommendations have just recently been standardized and are currently in production worldwide. One goal of this project is to identify where additions or changes might be needed to support ETS. This effort also involves work with the Internet Engineering Task Force (IETF) since many of the underlying protocols used in IPCablecom (as well as some of the ETS mechanisms) are under development in the IETF.

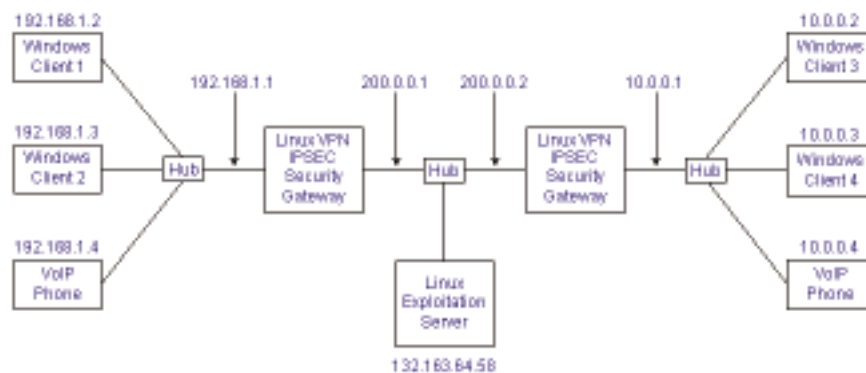Another important activity underway at ITS is a series of tests utilizing GETS over IPCablecom networks. The evolution of GETS from a PSTN-only service to one that will interoperate over the wireless, IPCablecom, and Next Generation Networks (NGN) is one of the goals of NCS.

Determining the security needs of ETS in IPCablecom networks is another goal of this effort. Figure 2 shows a laboratory setup to test proposed ETS mechanisms over virtual private networks (VPNs) and through firewalls. The setup is currently used to test the performance of Videoconferencing and Voice over IP (Internet protocol) over SIP (session initiation protocol). Proposed ETS mechanisms will be coded and tested over the same network to determine if they are viable from a Quality of Service (QoS) standpoint.

During FY 2002, ITS presented numerous technical and editorial contributions to T1A1.2 and ITU-T Study Group 9. Some of these were included in the new T1 ETS Technical Report mentioned above. In FY 2003, ITS will continue to participate in the development and standardization of ETS in T1A1, the IETF, and ITU-T Study Group 9. The projects will address technologies in the Next Generation Network and interactions with the IPCablecom networks. This work on ETS must of necessity be conducted with the help of representatives from network providers, cable television equipment manufacturers, and NCS. Additionally, the work in FY 2003 will focus on survivability and security in the NGN ETS as well as GETS in the IPCablecom networks.

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